

Appl. No. 09/482,023  
Amdt. dated July 28, 2003  
Reply to Final Office Action of April 28, 2003

## **REMARKS/ARGUMENTS**

Applicant acknowledges receipt of the Final Office Action dated April 28, 2003. In that action, the Examiner: 1) rejected claims 18, 20, 31-33 and 35 under 35 U.S.C., 112 as allegedly containing subject matter not described in the specification; and 2) rejected claims 10, 15-20 and 30-36 under 35 U.S.C. 103(a) as allegedly unpatentable over admitted prior art in view of Takada et al (JP 61-222939).

With this Office Action Response, Applicant amends claims 18 and 20 and maintains the withdrawal of claims 22-29. Applicant also respectfully submits new claims 37-40 for consideration by the Examiner. Applicant believes the pending claims are allowable over the art of record and respectfully requests reconsideration.

### **I. SECTION 112 REJECTIONS**

In the Office Action dated April 28, 2003, the Examiner rejected claims 18, 20, 31-33 and 36 as allegedly containing subject matter not described in the specification.

#### **A. Claim 18**

In particular, the Examiner correctly stated that claim 18 recites the limitation “ratio in the range from 3 to 7” while the specification does not disclose any range from 3 to 7. Thus, the Applicant has amended claim 18 to state “ratio in the range from 3 to 6.” Applicant respectfully submits that this amendment puts claim 18 in line with the subject matter described in the specification. Applicant respectfully submits that this amendment is merely to correct a grammatical error, and therefore that this is not a narrowing amendment which would give rise to *Festo*-type inquiries.

**B. Claim 20**

Examiner also rejected claim 20 because “the specification does not mention the relationship between the inner diameter of the quench ring and the diameter of the throat outlet, nor any benefits associated with controlling said relationship.” Figure 1 shows that the old design includes a quench ring inner diameter approximately equal to the throat outlet diameter  $D_2$ . The new design in Figure 3 comprises a quench ring inner diameter significantly greater than the throat outlet diameter  $D_4$ . Therefore, Applicant has amended claim 20 to retain the limitation “said quench ring has an inner diameter that is greater than the diameter of said throat outlet” while eliminating the limitation “said quench ring inner diameter being sufficiently large to substantially prevent damage to said quench ring.” Applicant respectfully submits that this amendment puts claim 20 in line with the subject matter described in the specification. Applicant respectfully submits that this amendment is not a narrowing amendment which would give rise to *Festo*-type inquiries.

**C. Claim 31**

The Examiner further rejected claim 31 because allegedly “[n]either the drawings, nor the specification disclose heating element extending from said outlet of the throat to said inlet of the throat.” Applicant respectfully submits that the specification does describe a heating element extending from the throat outlet to the throat inlet. The specification states that the “[electrical heating] concept can also be applied...to the entire hot face of the combustion chamber.” Specification as amended (hereinafter called “Specification”), p. 5, 3<sup>rd</sup> para. The specification also states that the “concept of electrical heating of the refractory can be extended to the entire gasifier

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hot face.” Specification, p. 6, last para. The “hot face” of the gasifier, combustion chamber or throat is defined as “the innermost layer...that is exposed to the hot gases.” Specification, p. 3, 2<sup>nd</sup> para. A heating element that extends to the entire gasifier or combustion chamber hot face, which includes the hot face of the throat area, necessarily includes a heating element that extends over the entire hot face of the throat, or from the throat outlet to the throat inlet.

Applicant respectfully submits that all of the subject matter claimed in claim 31 is sufficiently described in the specification, and thus the Examiner’s Section 112 rejection with respect to claim 31 has been addressed.

**D. Claim 32**

The Examiner rejected claim 32 because the “specification does not disclose any specifics of the recited heating element,” with the recited limitation being “said heating element is a spirally wound member having a first diameter near said throat inlet and a second diameter near said throat outlet, wherein said first diameter is greater than said second diameter.” First, as discussed above with regard to claim 31, the specification describes a heating element having a first diameter near the throat inlet and a second diameter near the throat outlet. Second, Applicant respectfully submits that Figures 3-5 show heating elements wound spirally around the throat, as seen in Figures 3 and 5, or wound spirally between the throat surfaces, as seen in Figure 4. Lastly, Applicant respectfully submits that Figure 4 shows a heating element having a greater diameter near the throat inlet than its diameter near the throat outlet, and Figure 5 shows a horizontal combustion chamber also having a spirally wound heating element where its diameter near the throat inlet is greater than its diameter near the throat outlet.

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Therefore, Applicant respectfully submits that all of the subject matter claimed in claim 32 is sufficiently described in the specification, and thus the Examiner's Section 112 rejection with respect to claim 32 has been addressed.

**E. Claims 33 and 36**

The Examiner rejected claims 33 and 36 because the specification allegedly does not "disclose a heating element extending from said outlet to of the throat to above said inlet of the throat." Applicant incorporates by reference the discussion with respect to claim 31 where it was argued that the specification discloses having a heating element that extends to the entire combustion chamber hot face. Applicant respectfully submits that such a heating element would extend from the throat outlet to above the throat inlet.

Therefore, Applicant respectfully submits that all of the subject matter claimed in claims 33 and 36 is sufficiently described in the specification, and thus the Examiner's Section 112 rejection with respect to claims 33 and 36 have been addressed.

Based on the foregoing, Applicant respectfully submits that all the Examiner's Section 112 rejections have been addressed.

**II. SECTION 103 REJECTIONS**

The Examiner rejected claims 10, 15-20 and 30-36 under 35 U.S.C. 103(a) as allegedly unpatentable over admitted prior art in view of Takada et al. With respect to claims 10 and 34, the Examiner states that allegedly "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to add an electrical heating element between said inner and said

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outer surfaces, as taught by Takada et al., in the apparatus of Admitted Prior Art, for the purpose of preventing slag solidifying in the throat.”

Takada teaches pre-heating a trough to 1000°C (1832°F), then decreasing the temperature until the operation (running the slag) is performed at 800°C (1472°F). Translation of Takada et al., entitled “Heating Trough” (hereinafter called “Takada”), pp. 4-5. The intended purpose of operating the trough under these conditions is to provide a temperature high enough so that the slag will not solidify, thereby preventing generation of a slag coating. Takada pp. 2-5. Therefore, Takada describes only an environment of a trough, which is not suggested to be any part of a gasifier or other reactor, but simply a trough, that provides an operating temperature of 1472°F.

The present specification describes heating the throat of a gasifier combustion chamber to at least 3000°F for the purpose of preventing slag solidification, especially those slags containing vanadium trioxide ( $V_2O_3$ ) or other metals or metal compounds that solidify at temperatures lower than 3000°F. Specification, pp. 2, 4. However, heating the throat is also intended to increase gasifier carbon conversion, increase syngas production, reduce steam consumption and increase temperatures inside the gasifier without increasing oxygen consumption. Specification, pp. 3, 6. The high temperatures obtained by heating the throat will increase the carbon conversion of the gasifier by 0.1 to 3.0 percent, and decrease the steam requirement for the gasifier from approximately 0.25 to 0.35 pounds of steam per 1.0 pound of feedstock to approximately 0.15 to 0.25 pounds of steam per pound of feedstock. Specification, p. 6.

Takada does not teach a temperature high enough or environment suitable to prevent solidification of slags containing vanadium trioxide ( $V_2O_3$ ) or other metals or metal compounds

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that solidify at temperatures lower than 3000°F. Takada teaches an environment including a trough, which is not suggested to be any portion of a gasifier, and an operating temperature (1472°F) less than half of the minimum preferred (3000°F) by the description in the specification. Furthermore, the invention of Takada cannot achieve the other benefits mentioned above. Therefore, the teachings of Takada are insufficient to suggest the proposed modification to the prior art gasifier for its intended purpose. Under *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984), “if [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” MPEP § 2143.01. Thus, there is no motivation to combine Takada with the prior art gasifier.

In addition to there being no motivation to combine Takada with the prior art gasifier, there is no reasonable expectation of success for making the modification because the Takada invention was intended for a trough, having a different shape than a throat and not being suggested as part of a gasifier reactor environment, being heated to much lower temperatures than those temperatures found in the throat of a gasifier. A reasonable expectation of success for making a modification is necessary in order to combine prior art references. MPEP § 2143.02; *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986). There is no suggestion in Takada that the materials used for the refractory (surface layer) or heating element, nor the construction of the trough as the trough is intended to be used, are satisfactory for the intended purposes of the present invention. Moreover, it is reasonable to assume that Takada discloses a heated trough including a heating element that is not satisfactory for use in a gasifier environment having temperatures two times as high as those

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described in Takada. Therefore, there is no reasonable expectation of success in modifying the prior art gasifier using the teachings of Takada.

Based on the foregoing discussion, Applicant respectfully submits that claims 10 and 34, and all claims which depend from claims 10 and 34, either directly or indirectly (claims 15-20, 30-33 and 35-36), should be allowed.

### **III. NEW CLAIMS 37-40**

Applicant respectfully requests consideration of new claims 37-40 as they are intended to more clearly reflect allowable subject matter in accordance with the specification, all of the Examiner's rejections and comments made heretofore and the discussions described herein. It is not the Applicant's intent to add claimed subject matter requiring a new search by the Examiner, but simply to add clarity to the claimed subject matter in view of the Examiner's rejections and comments to date. Support for the new claims can be found in the specification.

### **IV. CONCLUSION**

Applicant respectfully requests reconsideration, allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, she is respectfully requested to contact the undersigned.

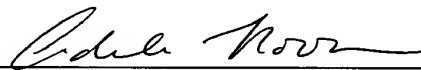
In the course of the foregoing discussions, Applicant may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This

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discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art which have yet to be raised, but which may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

  
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Attachments